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## INTERNATIONAL PRELIMINARY EXAMINATION REPORT

(PCT Article 36 and Rule 70)

(Rationalised Report according to the Notice of the President of the EPO published in the OJ11/2001)



Applicant's or agent's file reference <b>P02033</b>	<b>FOR FURTHER ACTION</b> See Notification of Transmittal of International Preliminary Examination Report (Form PCT/IPEA/416)	
International application No. <b>PCT/NO02/00332</b>	International filing date (day/month/year) <b>20/09/2002</b>	Priority date (day/month/year) <b>03/07/2002</b>
International Patent Classification (IPC) or national classification and IPC <b>C01B21/28</b>		
Applicant <b>NORSK HYDRO ASA et al.</b>		

1. This international preliminary examination report has been prepared by this International Preliminary Examining Authority and is transmitted to the applicant according to Article 36.
2. This **REPORT** consists of a total of 6 sheets, including this cover sheet.
- ☒ This report is also accompanied by ANNEXES, i.e., sheets of the description, claims and/or drawings which have been amended and are the basis for this report and/or sheets containing rectifications made before this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions under the PCT).

These annexes consists of a total of 2 sheets.

3. This report contains indications relating to the following items:

- I ☒ Basis of the report
- II ☐ Priority
- III ☒ Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
- IV ☐ Lack of unity of invention
- V ☐ Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
- VI ☐ Certain documents cited
- VII ☐ Certain defects in the international application
- VIII ☒ Certain observations on the international application

Date of submission of the demand <b>23/01/2004</b>	Date of completion of this report <b>27.08.04</b>
Name and mailing address of the IPEA/  European Patent Office D-80298 Munich Tel. (+49-89) 2399-0, Tx: 523656 epmu d Fax: (+49-89) 2399-4465	Authorized officer <b>Bernard Louis Petit</b> 

## I. Basis of the report

1. This report has been drawn up on the basis of *(Replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to the report since they do not contain amendments.)*

☐ the international application as originally filed

☒ the description, pages 1-9, as originally filed  
pages, filed with the demand  
pages, filed with the letter of

☒ the claims, Nos., as originally filed  
Nos., as amended under Article 19  
Nos., filed with the demand  
Nos. 1-11, filed with the letter of 09/08/04

☒ the drawings, sheets / fig. 1/2, 2/2, as originally filed  
sheets / fig., filed with the demand  
sheets / fig., filed with the letter of

2. The amendments have resulted in the cancellation of:

- ☐ the description, pages:  
☐ the claims, Nos.  
☐ the drawings, sheets / fig.

3. ☒ This report has been established as if (some of) the amendments had not been made, since they have been considered to go beyond the disclosure as filed (Rule 70.2 (c)).

4. Additional observations, if necessary:

The expression "wave breaker" was objected to as being unclear.

However the change made to the alternative expression "support structure" is regarded as going beyond the original disclosure. The passage on page 4, lines 7-9 generically refers to a specific embodiment as in FIG. IC in which a specific structure is installed to prevent the creation of a trough. The best unit which was constructed is not indicated in claim 1, which only refers to a vague "support structure" without indicating any precise means for achieving the desired result (which is not even indicated). The broadening of the expression originally used to

a generic "support structure" is therefore contrary to the requirements of Art. 41(2) PCT.

Consequently, pursuant to Rule 70.2(c), the present report will be established as if the original expression "wave breaker" was still used.

It should be noted, however, that the same objections regarding the clarity would apply to the vague expression "support structure".

**III. Non-establishment of opinion with regard to novelty, inventive step and industrial applicability**

The questions whether the claimed invention appears to be novel, to involve an inventive step (to be non-obvious), or to be industrially applicable have not been examined in respect of:

- ☒ the entire international application,  
☐ claims Nos.

because:

- ☐ the said international application, or the said claims relate to the following subject matter which does not require an international preliminary examination (*specify*): Nos.
- ☒ the description, claims or drawings (*indicate particular elements below*) or said claims are so unclear that no meaningful opinion could be formed (*specify*): Nos.

See Box VIII

- ☐ the claims, or said claims are so inadequately supported by the description no meaningful opinion could be formed. Nos.
- ☐ no international search report has been established for said claims Nos.

**VIII. Certain observations on the international application**

The following observations on the clarity of the claims, description, and drawings or on the question whether the claims are fully supported by the description, are made:

1. The term "wave breaker" has apparently no recognized and immediate meaning in the related art. Any use of this term to define a structure which is not better specified in terms of its position and connections with the other elements is therefore fully unclear.
2. It is immediately evident from the description and preferred embodiments that the "wave breaker" must be arranged in a specific area in the system, and cannot be defined in such broad terms as in claim 1 as being "fixed to the metal wall" at a location which may be above the gauzes or below the ceramic fillings in the basket.
3. It is unclear where the "bottom plate" should be arranged and which function it should satisfy. Likewise the means defining the zone in which the fillings are maintained should be clearly defined, for example by indicating that said fillings are arranged below the gauzes in a basket delimited by the screen (2) supporting the gauze pack (1), a metal side wall (4) and a perforated bottom plate(5).
4. The means ensuring the "wave breaker" effect should be accurately defined as in the description by indicating that they are fixed to the bottom plate(s), as is apparently necessary in any of the disclosed embodiments. No alternative corresponding to the claimed embodiment in claim 1, in which the said means would be fixed only to the wall (a), is disclosed.
5. Only specific configurations of the "wave breakers" are disclosed. Any internal element assimilated for example to fillings could however correspond to the claimed definition.
6. It is further unclear how an unspecified "wave breaker" may be filled with fillings as in claim 2, especially if said element is a sheet.
7. Claims 3 and 4 are also open to the same objection, since the position of the ridge or sheet is fully unclear. This objection obviously applies to claims 5-7.
8. The same objection as above further applies to the honeycomb structure of claims 8 and 9.
9. The objections raised in connection with the apparatus claims equally apply to the method of claims 10 and 11.

10. It would additionally be unclear which difference is to be seen between the unclear "wave breaker" as claimed and similar elements used in the prior art, even if they are not termed "wave breakers". Examples only of said elements are the "support" (11) of WO-A-91/08982, and the anti-vibration element (21) of DE-A-2 754 643.
11. The arguments of the applicant are not persuasive for the following reasons:
- (a) The reasons why the alternative expression "support structure" would still be open to objection as under item 1 above have been indicated.
  - (b) The precise position and connections of the wave breaker are not indicated in claim 1, even if the expression "below the gauzes" has been added. The breaker may thus be located below the bottom plate.
  - (c) The explanations in the reply regarding item 3 are not reflected in claim 1. Use of a clearer definition as suggested for instance in said item 3 appears necessary.
  - (d) The explanations regarding item 4 are also not reflected in claim 1, even if they would apparently confirm the analysis made under item 4.
  - (e) The arguments regarding item 6 are not convincing. Basically the applicant would agree that the filling elements are not located within the wave breaker, but instead in a space (between the breaker and other elements) to be defined in the claims.
  - (f) The remarks about items 7, 8 and 9 are not reflected in the claims.
  - (g) The comments regarding the cited documents have been noted. The differences pointed out in the reply are not reflected in the claims. In addition, reference was made in the first report to element (21) used as anti-vibration support in DE-A-2 754 643.

## Claims

1. A support system for catalyst gauzes in an ammonia oxidation burner, where the catalyst gauzes (1) and possibly support screens are being supported by ceramic fillings (3) and/or catalyst contained in a burner basket with metal walls (4) and a perforated bottom plate (5),  
characterized in that a support structure (9, 11) is fixed to the metal wall and/or the outer part/periphery of the bottom plate below the gauzes (1).
2. A support system according to claim 1,  
characterized in that the support structure is a triangular shaped ridge (11).
3. A support system according to claim 1,  
characterized in that the support structure is a smooth or perforated sheet (9) arranged at an angle of 10-60° to the wall.
4. A support system according to claim 3,  
characterized in that the angle is 25-35°.
5. A support system according to claim 2, 3 or 4,  
characterized in that the support structure is made of segments.
6. A support system according to claim 5,  
characterized in that the segments have end walls.
7. A support system according to claim 1,  
characterized in that the support structure is a honeycomb structure.
8. A support system according to claim 7,  
characterized in that the honeycomb structure has a sloping top (8).

9. A support system according to any of claims 2-8,  
characterized in that the support structure is filled with ceramic fillings/  
catalyst or similar material to obtain the same flow resistance as the filling material of  
the bed.
10. A method of reducing movement of ceramic material and avoiding tearing of catalyst  
gauzes in an ammonia oxidation burner where the catalyst gauzes and possibly support  
screens are being supported by ceramic fillings and possibly a catalyst on a perforated  
plate or contained in a burner basket with metal walls and perforated bottom plate,  
characterized in that a support structure is fixed to the metal wall and/or  
the outer part/periphery of the bottom plate of the burner basket below the gauzes and  
moves the ceramic material together with the metal wall during expansion.
11. Method according to claim 10,  
characterized in that it is used a support structure formed like a triangular  
shaped ridge, a smooth or perforated sheet or a honeycomb structure.